

REMARKS

Claims 1-10 were pending in the subject application. Claim 7 was cancelled in view of the amendment to claim 6. Upon entry of the foregoing amendments, claims 1-6 and 8-10 will be before the Examiner for consideration.

Drawings

The Examiner objects to Figure 2 as being not legible. Applicants provide herewith a replacement sheet that includes a new Figure 2 with improved clarity. No new matter is added by this new drawing submission. Reconsideration is requested.

Sequence Listing

Sequences on pages 18 and 19 of the present application were said to not include correlating sequence identifiers. Accordingly, paragraphs 0086 and 0092 have been amended above to properly cite to the SEQ ID Nos pertaining to the stated sequences. Reconsideration is requested.

112, second paragraph rejections

Claims 1-10 have been rejected under 35 USC § 112, second paragraph, based on indefiniteness. Applicants believe that the numerous amendments to the claims above address each of the stated bases of this rejection. Applicants respectfully request reconsideration.

Enablement

Claims 1-5 and 7-10 are rejected under 35 USC § 112, first paragraph, for lacking enablement. Applicants believe that the amendments to claims 1 and 5 obviate the grounds for this rejection. Claims 1 and 5 have been amended to remove reference to specific sequence identity to SEQ ID NO. 2. One skilled in the art would be able to readily determine sequences pertaining to an aspartate decarboxylase polypeptide. Moreover, claims 2-4 and claims 6, 8 and 10 ultimately depend from claim 1, and are therefore construed to contain the limitations of such independent claim. These dependent claims should also be considered enabled. In view of the foregoing remarks and amendments, Applicants respectfully request reconsideration of this rejection.

Written Description

Claims 1-5 and 7-10 are rejected under 35 USC § 112, first paragraph, as they are said to lack written description. Applicants believe that the amendments to claims 1 and 5 obviate the basis of this rejection. One skilled in the art would readily appreciate sequences pertaining to aspartate decarboxylase in light of the general understanding in the art. Moreover, claims 2-4, 6 and 8-10 depend from claim 1, and are therefore construed to contain the limitations of such independent claim. These dependent claims should also be considered to satisfy the written description requirement. In view of the foregoing remarks and amendments, Applicants respectfully request reconsideration of this rejection.

Obviousness

Claims 1-10 are rejected under 35 USC § 103(a) as being obvious over Fouad et al. Applicants respectfully traverse.

The examiner argues "that it would have been obvious for one skilled in the art at the time the invention was made to express aspartate decarboxylase in a plant taught by Fouad to increase the plant's level of osmoprotectants ...". Applicants respectfully assert that, contrary to this allegation, it was not known whether aspartate decarboxylase, a bacterial protein which undergoes protein self-processing prior to becoming an active enzyme, would be properly expressed, processed and folded, or achieve functionality in a higher plant, or not be digested by proteases in higher plants. Although Fouad explicitly stated that "our goal is to utilize E. coli panD gene to engineer beta-alanine over-production in transgenic plants", it was not known whether the overproduction of beta-alanine would lead to increased tolerance to stress or biomass yield. Prior to what was disclosed in the present application, beta-alanine level itself has not been linked to improved stress tolerance in any system.

As a related point, the examiner states that "[I]t was also known plants can convert beta-alanine to beta-alanine betaine". However, this is not completely accurate, only certain plants of the family Plumbaginaceae, have been discovered to possess the

pathway to convert beta-alanine to beta-alanine betaine. Thus, it is not true that all plants will convert beta-alanine to beta-alanine betaine.

Regardless, survival of transgenic plants after foreign gene expression with normal growth and reproduction capabilities is a new challenge for each protein. Generally, a researcher designing an experiment embarks upon such research objectives with a "hope to succeed." However, this 'hope to succeed', which is a merely a wish, should not be confused with "a reasonable expectation of success," which presupposes a scientific conclusion based on known, available facts. The successful transformation of a plant cell with an aspartate decarboxylase sequence, the successful translation of such sequence, the successful stability (e.g. resistance to enzyme degradation) of the sequence product if expressed, the successful folding of the sequence product if expressed and not degraded, or the successful achievement of functionality of the expressed sequence product, assuming proper translation, stability, folding and processing even occur, could not be presupposed. Thus, Applicants assert that the Fouad et al. reference would not establish an expectation of success to one skilled in the art. On this basis alone, the cited references do not reasonably support a *prima facie* case of obviousness.

In addition, the remarkable results that the Applicants observed with respect to the robustness and heat, drought and salt tolerance of the plants that were transformed to express the recited aspartate decarboxylase polypeptide were impressive and quite surprising. These unexpected results represent a strong secondary characteristic of patentability and further bolster Applicants position that the Fouad et al. reference does not render the claims obvious. Accordingly, in view of the foregoing remarks, Applicants respectfully request reconsideration of this rejection.

Having addressed the issues raised in the last office action, Applicant urges that the present application is in a condition for allowance. Applicant requests that the undersigned be contacted to arrange an interview should the Examiner be of the opinion that issues still exist preventing allowance of the application.

Respectfully submitted,

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